Please amend the claims as follows:

1. (Currently Amended) A method of optically interconnecting layers in an optical integrated circuit including a substrate, the method comprising:

forming a first optical transmission layer over the substrate;

forming a first cladding layer on the first optical transmission layer;

removing portions of the first cladding layer to form an angled sidewall in the first cladding layer, the angled sidewall having an angle that is less than 90 degrees; and

forming an optical interconnect layer on the angled sidewall of the first cladding layer and on an exposed portion of the first optical transmission layer.

2. (Original) The method of claim 1 wherein the first optical transmission layer and the optical interconnect layer each comprise silicon oxynitride.

3. (Original) The method of claim 1 wherein the cladding layer comprises silicon dioxide.

4. (Original) The method of claim 1 wherein the angled sidewall of the first cladding layer has an angle of less than 50 degrees.

5. (Currently Amended) A method of optically interconnecting layers in an optical integrated circuit including a substrate, the method comprising:

forming a first optical transmission layer over the substrate;

forming a first cladding layer on the first optical transmission layer;

removing portions of the first cladding layer to form an angled sidewall in the first cladding layer;

forming an optical interconnect layer on the angled sidewall of the

first cladding layer and on an exposed portion of the first optical transmission layer; and ~~The method of claim 1~~ wherein removing portions of the cladding layer to form an angled sidewall comprises:

forming mesa structures on the cladding layer at desired locations; and

removing the mesa structures and exposed portions of the cladding layer to form the angled sidewall in the cladding layer.

6. (Original) The method of claim 5 wherein forming mesa structures comprises:

patterning the cladding layer with photoresist; and

reflowing the photoresist to create the mesa structures.

7. (Currently Amended) The method of claim ~~1~~ 5 further comprising:

forming a second cladding layer on the optical interconnect layer;

removing portions of the second cladding layer to expose a portion of the optical interconnect layer that is formed on the angled sidewall of the first cladding layer; and

forming a second optical transmission layer on the second cladding layer and on the exposed portion of the optical interconnect layer.

8. (Original) The method of claim 7 wherein forming a second optical transmission layer includes forming desired optical components in the second optical transmission layer.

9. (Original) The method of claim 1 wherein removing portions of the first cladding layer to form an angled sidewall in the first cladding layer includes removing portions of the cladding layer to form the exposed portion of the first optical transmission layer.

10. (Original) A method of optically interconnecting layers in an optical integrated circuit including a substrate, the method comprising:

forming a first optical transmission layer over the substrate;

removing portions of the first optical transmission layer to form respective active regions of the first optical transmission layer, with void regions being defined between the active regions;

forming a first dielectric layer in the void regions and on the active regions of the first optical transmission layer;

removing portions of the first dielectric layer to planarize upper surfaces of the layer in the void regions and upper surfaces of the active regions of the first optical transmission layer;

forming a first cladding layer on the planarized upper surfaces of the void regions and active regions of the first optical transmission layer;

forming mesa structures on the first cladding layer;

removing the mesa structures and portions of the first cladding layer to form angled sidewalls in the first cladding layer on respective active regions of the first optical transmission layer;

forming a second optical transmission layer on the angled sidewalls in the first cladding layer and on respective active regions for each sidewall.

11. (Original) The method of claim 10 further comprising;

forming a second cladding layer on the second optical transmission layer;

removing portions of the second cladding layer and the second optical transmission layer to form vertical optical interconnects corresponding to the portions of the second optical transmission layer formed on the sidewalls of the mesa structures, the vertical optical interconnects having ends exposed on an upper planar surface; and

forming a third optical transmission layer on the upper planar surface and on ends of the vertical optical interconnects.

12. (Original) The method of claim 11 wherein removing portions of the second cladding layer and the second optical transmission layer includes removing portions of the first cladding layer in forming the upper planar surface.

13. (Original) The method of claim 11 wherein the first dielectric layer and the cladding layers comprise silicon dioxide, and wherein the first, second, and third optical transmission layers comprise silicon oxynitride having the same indices of refraction.

14. (Original) The method of claim 13 wherein the angled sidewalls in the first cladding layer have angles of less than 50 degrees.

15. (Currently Amended) An optical integrated circuit formed on a substrate, comprising:
a lower optical transmission layer formed over the substrate;
a first cladding layer having an angled sidewall formed on the first optical transmission layer, the sidewall having an angle relative to the lower optical transmission layer; and
a second optical transmission layer formed on the lower optical transmission layer and on the angled sidewall of the first cladding layer, wherein the second optical transmission layer has an angle relative to the lower optical transmission layer that is defined by the angle of the angled sidewall and wherein the angle has a value between approximately five degrees and a maximum angle having a value defined by indices of refraction of the second optical transmission layer and the first cladding layer and wherein light having a same mode as light propagating through the lower optical transmission layer propagates through the second optical transmission layer through total internal reflection.

16. (Original) The optical integrated circuit of claim 15 wherein the lower optical transmission layer and second optical transmission layer each comprise silicon oxynitride having the same indices of refraction, and wherein the first cladding layer comprises silicon dioxide.

17. (Previously Presented) The optical integrated circuit of claim 16 wherein the angle of the angled sidewall of the first cladding layer has an angle of less than approximately 50 degrees.

18. (Currently Amended) An optical integrated circuit formed on a substrate, comprising:
a lower optical transmission layer formed over the substrate;
a first cladding layer having an angled sidewall formed on the first optical transmission layer;
an optical interconnect formed on the angled sidewall and coupled to the lower optical transmission layer, the optical interconnect having an angle relative to the lower optical transmission layer that is defined by the angle of the angled sidewall and wherein the angle has a value between approximately five degrees and a maximum angle having a value defined by indices of refraction of the optical interconnect and first cladding layers; and
an upper optical transmission layer coupled to the optical interconnect, wherein light having a same mode as light propagating through the lower optical transmission layer propagates through the optical interconnect through total internal reflection and through[[t]] the upper optical transmission layer.

19. (Original) The optical integrated circuit of claim 18 wherein the optical interconnect and the upper optical transmission layer comprise the same layer.

20. (Original) The optical integrated circuit of claim 18 wherein the lower optical transmission layer, optical interconnect, and upper optical transmission layer comprise silicon oxynitride having the same indices of refraction, and wherein the first cladding layer comprises silicon dioxide.

21. (Previously Presented) The optical integrated circuit of claim 20 wherein the angle of the optical interconnect has an angle of less than approximately 50 degrees.

22. (Currently Amended) An optical system, comprising:

system circuitry containing an optical integrated circuit formed on a substrate, the optical integrated circuit comprising:

a lower optical transmission layer formed over the substrate;

a first cladding layer having an angled sidewall formed on the first optical transmission layer, the sidewall having an angle relative to the lower optical transmission layer; and

a second optical transmission layer formed on the lower optical transmission layer and on the angled sidewall of the first cladding layer, wherein the second optical transmission layer has an angle relative to the lower optical transmission layer that is defined by the angle of the angled sidewall and wherein the angle has a value between approximately five degrees and a maximum angle having a value defined by indices of refraction of the second optical transmission layer and the first cladding layer, and wherein light having a same mode as light propagating through the lower optical transmission layer propagates through the second optical transmission layer through total internal reflection.

23. (Original) The system of claim 22 further including an input device and an output device coupled to the system circuitry.

24. (Original) The system of claim 22 wherein the optical system further comprises electronic components coupled to the system circuitry.